



Division of Agricultural Sciences
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Burmosa and Redheart



TWO NEW PLUM VARIETIES

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Actual color photos of Burmosa (above) and Redheart, the two new plum varieties described in this bulletin. The detailed discussion of Burmosa starts on page 4; the discussion of Redheart starts on page 11.



BURMOSA and REDHEART . . .

the two new plum varieties described in this bulletin, originated at the Agricultural Experiment Station, at Davis, under a breeding program conducted over a period of 15 years, starting in 1932, in co-operation with the U. S. D. A.

Both varieties show promise for commercial plantings, but since they have not been extensively tested as yet, they can be recommended for experimental plantings only at this time. They have been released for trial by growers mainly because of the widespread interest shown in them.

The characteristics of both varieties are discussed in detail starting on page 3. The following is a brief summary of their good and bad points, as known at the present time.

BURMOSA . . .

appears to be a possible substitute for Beauty because of its early maturity, larger size, longer storage and holding life, and firmer texture. However, it has a tendency to set lighter crops than Beauty. It is self-unfruitful. In some seasons it has a tendency to show skin bruises, which may be seriously accentuated by belt-line packing methods commonly in use.

When harvested for shipping, Burmosa develops, during shipping and on the market, an external color somewhat like that of Becky Smith—a bright pinkish-red. Its flavor is similar to that of Formosa as is its flesh color.

REDHEART . . .

closely resembles Duarte, and appears to be a good variety for the foothill and Sacramento Valley plum districts. In these areas it ripens a little later than Santa Rosa and comes on the market with, or slightly before, early shipments of Duarte from the San Joaquin Valley.

Tests have shown Redheart to be excellent for cross-pollination with Elephant Heart—both varieties seeming to benefit from the cross by good sets of fruit.

Redheart has shown no obvious weaknesses thus far, but has been observed only in young trees. Such weaknesses as may develop with age have not had a chance to become apparent.

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B U R M O S A

Burmosa resulted from a cross made in 1940 between Burbank and Formosa, using the latter variety as the pollen parent. It has been tested under the number 26-26 in Placer and Tulare counties, and at the Wolfskill Experimental Orchards in Solano County.

Characteristics of the tree

Table 1 (page 6) compares some of the tree, fruit, and maturity characteristics of Burmosa and Redheart with those of Beauty, Santa Rosa, and Duarte. (Redheart is discussed in detail starting on page 11.)

As can be seen from the table, Burmosa compares quite favorably with Beauty; beginning to mature in Beauty season, it will compete with that variety. It does not set as heavily, but has been consistent in setting from fair to good crops. Thinning expenses are proportionately less and the variety has usually set adequate crops for commercial purposes.

Table 2 (page 7) shows blooming and ripening data for the same varieties compared in table 1.

The early leafing of Burmosa indicates that it has a relatively light chilling requirement, and on this basis should do well wherever Santa Rosa can be grown successfully.

Burmosa tends to bloom slightly earlier than most other Japanese plum varieties. Following warm winters the difference may be exaggerated, and may lead to some difficulty in cross-pollination. For most varieties that would be grown with Burmosa, however, this does not seem to be a serious factor in its culture, for there is normally a good overlap in bloom period with the other common Japanese plum varieties.

The average date of maturity shown in table 2 indicates that Burmosa ripens slightly before Beauty at Winters, Cali-

fornia, but this may not hold true in other districts. If commercial tests with mature trees indicate an earlier harvest season for Burmosa, this will be of advantage—but at this time it should not be considered one of the established merits of this variety. Under the conditions of growth at Winters, Burmosa has required about the same number of days from full bloom to maturity as Beauty, thus its earlier maturity in that location has been due to earlier bloom.

Burmosa reached satisfactory shipping maturity in Tulare County after the first picking of Beauty plums in 1950. In 1951, the same relation held, and the fruit reached an even more satisfactory stage of maturity a few days later. Because of the greater firmness of Burmosa as compared with Beauty, the latter variety could not be picked at such an advanced stage and shipped to distant markets. Present observations in Tulare County indicate that Burmosa will probably mature after the first harvest of Beauty, coincident with the second picking of that variety. It can be held on the tree for a longer period, however, resulting in a substantially later harvest, if desirable. As the present test plantings involve only young trees, these observations are tentative and may be modified toward an earlier season on mature trees.

The pollination requirements of Burmosa, insofar as they have been determined at this writing, are summarized in figure 1. As this variety will most likely be planted in orchards with the older, standard kinds of plums, Burmosa has been used as the fruiting parent in these tests.

Both Burmosa and Redheart produce abundant pollen, and from what is known of the compatibility relationships in Japanese plums, it seems safe to predict that reciprocal combinations will be satisfactory.

Burmosa is self-unfruitful and requires cross-pollination. If figure 1 is compared with figure 2 (the corresponding chart of crosses made with Redheart, shown on page 10), it will be noted that Burmosa has shown a much lower per cent set in the various combinations than Redheart. Most of the values show the usual range for such experimental work. However the values shown for Redheart are phenomenal for Japanese plums.

In the case of Burmosa, values below one per cent are considered to indicate cross-incompatible combinations and such varieties should not be used as pollinizers for Burmosa. Those showing 1.4 to 2.2 per cent are in the doubtful class. It is probable that further work might prove that these varieties are adequate pollenizers for Burmosa, with possible exceptions—Beauty, for instance, which often yields small quantities of poor pollen.

Varieties which have set more than 3.0 per cent on Burmosa can be considered adequate pollenizers, although very late-blooming varieties might well be avoided because Burmosa is known to bloom

early. Such successful combinations include those with Becky Smith, Duarte, Flaming Delicious, Gaviota, Santa Rosa, and Wickson.

In two tests in which Burmosa was used as a pollen parent, the results indicate that Burmosa will not pollinate Apex (set 0.6 per cent in 1949), but will give good sets on Duarte (35.1 per cent in 1949).

Characteristics of the fruit

Table 1 (page 6) also compares some of the characteristics of the fruit of Burmosa and Redheart with Beauty, Santa Rosa, and Duarte. (More detailed information on Redheart begins on page 11.)

Burmosa has sized its fruit much better than Beauty, which is one of the reasons for considerable grower interest in it. It is also a firmer plum than Beauty, has a longer storage and market life, and does not become watery when full ripe. Its flavor is similar to that of Formosa, but perhaps milder, with not quite so pronounced an aroma. Flesh color is quite similar to Formosa.

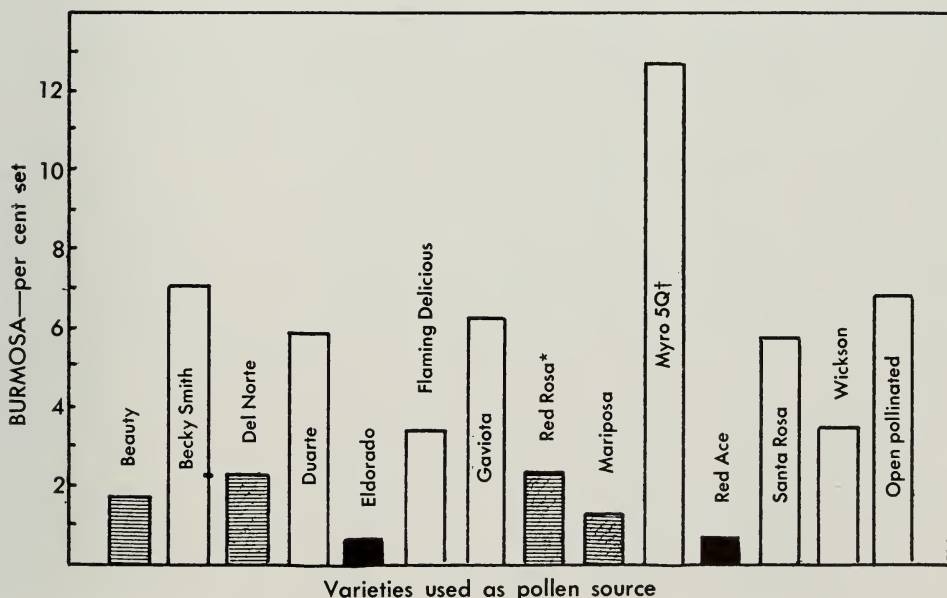


Fig. 1. Pollination chart for Burmosa.

TABLE 1. A Comparison of Some Tree and Fruit Characteristics of BURMOSA and REDHEART Plums with Those of Standard Varieties Beauty, Santa Rosa and Duarte.

	Beauty	BURMOSA	Santa Rosa	REDHEART	Duarte
Tree Characters					
Full Bloom *	March 9	March 5	March 6	March 9	March 10
Amount of bloom	Heavy	Heavy	Medium to heavy	Heavy	Heavy
Chilling requirement†	Moderate	Light to moderate	Light to moderate	Moderate	Moderate
Productivity	Very productive	Fair to good	Productive	Very productive	Very productive
Tree vigor	Vigorous	Vigorous	Vigorous	Very vigorous	Vigorous
Fruit Character					
Size of fruit	Medium	Medium to large	Medium to large	Medium to large	Medium to large
Skin ground color	Bright amber yellow	Bright amber yellow	Bright amber yellow	Dull greenish amber	Dull greenish amber
Blush	Medium red; to 100% when tree ripe	Medium, red; to 50-75% when tree ripe	Medium to deep red; to 100% when tree ripe	Dull, mottled red	Dull mottled red
Flesh color	Yellowish-amber, becoming diffused with red from the skin	Creamy amber	Amber diffused with red from the skin, becoming full red when soft ripe	Bright red, over amber base	Red, over amber base
Flesh texture	Firm-melting, becoming watery	Firm-melting, very fine grained	Firm-melting, becoming watery	Firm-melting, meaty	Firm-melting, meaty
Flavor	Excellent	Excellent (Formosa-like)	Excellent	Excellent (Duarte-like)	Excellent
Stone size	Small-medium	Small-medium	Medium	Medium	Medium
Stone adhesion	Clingstone	Freestone, except at suture	Clingstone	Nearly free	Nearly free
Tree ripe *†	June 12	June 10	June 25	July 8	July 27
Characteristics at shipping maturity					
Skin color	Greenish, straw at tip	Greenish	Greenish, straw at tip	Dull green, red developing	Dull green, red developing
Flesh color	Greenish white	Greenish white	Greenish white	Turning red	Turning red
Flesh texture	Firm, crisp	Dry, meaty	Firm, crisp	Firm, crisp	Firm, crisp
Market color	Full, medium red	Full pinkish red	Full deep red	Dull mottled red	Dull mottled red
Commercial Use	Shipping, dessert	Shipping, dessert	Shipping, dessert	Shipping, dessert	Shipping, dessert

* Average of 6 years, near Winters, California.

† Approximately 15 per cent of crop full tree ripe.

‡ Based on leading data. Relative amount of chilling required to break the rest period. Varieties with moderate or greater chilling requirements will not do well in areas with relatively mild winters.

At proper maturity for shipping, Burmosa shows less color than Beauty but develops a full pink color after transport and in the retail market, somewhat like the coloring of Becky Smith.

Shipping maturity of plums is often rather difficult to determine accurately from observations of the developmental

stages of the fruit on the tree. This has been especially true of Burmosa which, as stated above, develops in a manner different from either Beauty or Santa Rosa. For this reason simulated shipping tests were made. The fruit was harvested at various stages of maturity, held for a time approximating normal transit pe-

TABLE 2. Phenological Data for BURMOSA and REDHEART Plums in Comparison with Beauty, Santa Rosa, and Duarte (Standard Varieties), Arranged in Order of Increasing Number of Days from Full Bloom to Maturity. All Data from Wolf-skill Experimental Orchards, near Winters, California.

Character and year	Beauty	BURMOSA	Santa Rosa	REDHEART	Duarte
Date of full bloom					
1946.....	Mar. 10	Mar. 1	Mar. 7	Mar. 8	Mar. 9
1947.....	Mar. 2	Mar. 1	Mar. 1	Mar. 5	Mar. 7
1948.....	Mar. 4	Feb. 26	Feb. 25	Feb. 28	Mar. 1
1949.....	Mar. 21	Mar. 17	Mar. 18	Mar. 21	Mar. 21
1950.....	Mar. 3	Mar. 1	Mar. 2	Mar. 5	Mar. 3
1951.....	Mar. 15	Mar. 12	Mar. 14	Mar. 15	Mar. 16
Av., 1946-1950.....	Mar. 9	Mar. 5	Mar. 6	Mar. 9	Mar. 10
Date of first leaf					
1946.....	Mar. 13	Mar. 3	Mar. 4	Mar. 10	Mar. 15
1947.....	Feb. 27	Feb. 24	Mar. 3	Mar. 8	Mar. 4
1948.....	Feb. 27	Feb. 26	Feb. 26	Mar. 3	Feb. 27
1949.....	Mar. 23	Mar. 19	Mar. 21	Mar. 22	Mar. 19
1950.....	Mar. 6	Mar. 8	Mar. 7	Mar. 14	Mar. 5
1951.....	Mar. 18	Mar. 18	Mar. 15	Mar. 19	Mar. 19
Av., 1946-1950.....	Mar. 10	Mar. 7	Mar. 8	Mar. 13	Mar. 10
Date of tree ripe fruit					
1946.....	June 13	.....	June 24	July 18	Aug. 10
1947.....	June 7	June 2	June 12	June 30	July 25
1948.....	June 17	June 19	June 27	July 15	Aug. 4
1949.....	June 16	June 14	July 2	July 7	July 25
1950.....	June 14	June 7	July 1	July 3	July 19
1951.....	June 7	June 7	June 23	July 6	July 18
Av., 1946-1950.....	June 12	June 10	June 25	July 8	July 27
Days from full bloom to tree ripe					
1946.....	95	..	109	132	154
1947.....	97	93	103	117	140
1948.....	105	114	123	138	156
1949.....	87	89	106	108	126
1950.....	100	98	121	120	138
1951.....	84	87	101	113	124
Av., 1946-1950.....	95	96	110	121	140

TABLE 3. Fruit of Burmosa and Beauty Plums Compared when Harvested

Characteristic and harvest date	Condition at harvest		Condition after 10 days	
	Beauty	Burmosa	June 12	
			Beauty	Burmosa
Pressure test reading (lbs.)				
May 26.....	22.9	24.5	3.0	5.5
May 29.....	20.4	19.2	....	....
June 1.....	18.0	11.0	....	....
June 5.....	13.2	7.4	....	....
Soluble solids (%)				
May 26.....	....	....	11.0	12.6
May 29.....	10.7	14.0	....	....
June 1.....	13.4	*	....	....
June 5.....	13.4	*	....	....
Skin color†				
May 26.....	1-1½	1-1	mostly full red, a few 50-75%	3-4, mostly a full pinkish red
May 29.....	1½-2	1-1½	....	....
June 1.....	2	1½-2	....	....
June 5.....	2-3½	2-3	....	....
Flesh color				
May 26.....	whitish-green	greenish-white	light red	creamy amber
May 29.....	greenish-white to yellowish-white	greenish-white to white	....	....
June 1.....	greenish-yellow	whitish-amber	....	....
June 5.....	greenish-amber	greenish-amber	....	....
Condition				
May 26.....	....	....	good	good
May 29.....	....	....	good	good
June 1.....	....	....	....	....
June 5.....	....	....	....	....

* Flesh mealy; juice sample could not be obtained.

† Ground color as measured by an Allen color chart.

riod, and the ripening changes were observed after that period.

Table 3 (above) shows the results of these tests. For this purpose, the fruit was harvested on May 26, May 29, and

June 1 and 5, 1950, at Winters, California. It was then held for a period of approximately 10 days at 42° F at Davis. It was then removed from storage and allowed to ripen at room temperature.

on Different Dates and Given a Simulated Transit and Ripening Period

at 42° F., followed by a ripening period at room temperature to dates shown

June 17		June 21	
Beauty	Burmosa	Beauty	Burmosa
....		
....		
3.0	3.0		
3.0	3.0		
....		
10.1	12.2		
....	15.6		
12.2	16.0		
full red	bright, light red	dull, dark red	bright, light red
dull red	bright, light red	dull, dark red	bright, light red
deep red	nearly full light red, good	dull, dark red	bright, light red
bright, med. red	yellowish-amber, lt. red 20-50%	dull, dark red	bright, light red
red	amber	dark red	creamy amber
red	yellow-amber	dark red	creamy amber
red	yellow-amber	dark red	creamy amber
amber-red	light yellow-amber	dark red	creamy amber
fair, slightly shriveled, soft	good	poor, overripe	poor, harvested too green
good	good	poor, overripe	good, approaching end, slight shriveling
good	not fully ripe	poor, overripe	good, still fully accept- able
good	not fully ripe	poor, overripe	good, prime

Notes were taken on the changes in condition of the fruit on June 12, 17, and 21.

Beauty apparently reached optimum shipping maturity May 30-June 1, as indicated by the holding tests. All samples

were in excellent condition on June 17, except for the earliest harvest sample of May 26, which was removed from storage on June 5, and which was beginning to shrivel. It was in only fair condition by

June 17. All samples of Beauty were overripe by June 21.

Burmosa, on the other hand, was in excellent condition on June 17—regardless of time of harvest—although the sample taken on May 26 did not have as good quality, and was considered to have been harvested too green. By June 21, in contrast to the Beauty samples, all except the May 26 harvest sample of Burmosa were still in edible condition. The sample taken on May 29 showed slight shriveling, and was approaching the end of its market life. The sample taken on June 1 was still in good condition, and quite acceptable as market fruit. The sample of June 5 was still in prime condition on June 21.

From these tests it appears that Burmosa reached shipping maturity about the same time as Beauty, or a day or so earlier.

The sample of Burmosa harvested on May 29 can be considered to have been

picked as early as would give a satisfactory market product. In contrast to Beauty, which ripens rapidly, Burmosa held well on and off the tree. Samples taken a week later, on June 5, also stood up well in the tests. All samples were taken at random, rather than having been picked according to any maturity standard.

From these studies the following recommendations regarding the shipping harvest of Burmosa can be made:

Burmosa should be harvested without waiting for the development of tip straw color, as this change is not characteristic of the particular variety at shipping maturity.

While one year's results are not conclusive, the pressure test with a 7/16-inch plunger was approximately 19 pounds, and the soluble solids approximately 14 per cent at shipping maturity.

A rather consistent measure of maturity, observed in this and other years, is



Fig. 2. Pollination chart for Redheart.

the flesh texture development of Burmosa. From the hard, crisp texture characteristic of green fruit, the flesh becomes somewhat mealy and rather dry at the approximate shipping harvest maturity. (At this stage a juice sample could not be obtained for determining soluble solids.)

As it ripens the flesh becomes very fine-grained and moderately juicy, but the dry stage appears to be closely correlated with satisfactory harvest maturity.

Burmosa's place in the plum industry

Burmosa appears to be a possible substitute for Beauty. Its advantages over that variety are: approximately the same season of maturity, larger size, longer storage and holding life, and firmer texture.

Characteristics of contrasting but not necessarily superior nature are these: when harvested for shipping, Burmosa develops during transit and on the market, an external color somewhat like that of Becky Smith—a bright pinkish-red; the flavor of Burmosa is similar to that of Formosa, but perhaps milder, with not quite so pronounced an aroma; the flesh color is quite similar to that of Formosa.

As observed to date and noted earlier, the noticeable faults of Burmosa appear to be a tendency to set rather light crops, and, in some seasons, to show skin bruises. The latter characteristic was not noted until the 1950 season, when the variety matured during extremely hot weather; the development of the external color after a storage and ripening period obscured these superficial marks.

R E D H E A R T

Redheart was selected from a group of seedlings grown from the cross Duarte \times Wickson, using Wickson as the pollen parent. The cross was made in 1940. It, too, has been tested in Placer, Solano, and Tulare counties, under the number 10-29. A small commercial test in Placer County has given valuable information on the shipping characteristics of this variety under actual commercial conditions.

Characteristics of the tree

Because Redheart is so similar to Duarte in nearly all respects, it is easily characterized by comparison with that variety (see table 1, page 6).

Table 2 (page 7) shows the blooming and ripening data for Redheart, and here again it is apparent that this new variety is similar to Duarte except in time of maturity. For example, Redheart blooms at the same time as Duarte, but leafs out just a few days later. This behavior may indicate a rather high chilling requirement, and possibly that Redheart should

not be grown in southern California or other plum districts with mild winters.

Redheart matures between Santa Rosa and Duarte, usually about 20 days before Duarte at Winters, but as shown in table 2, there is some variability in this respect.

Redheart is self-unfruitful and requires provision for cross-pollination. Known pollination requirements of Redheart are summarized in figure 2 on page 10. Comparing this chart with figure 1, on page 5, it will be noticed that Redheart set very heavily.

For this variety, then, values below 4.0 per cent should be considered to be the result of cross-incompatible combinations and are to be avoided in planting pollinizers for Redheart. Duarte and Eldorado are the two such varieties thus far determined.

As Redheart resulted from a cross between Duarte \times Wickson, the fact that it is cross-sterile with Duarte indicates that it should be cross-fertile with Wickson—and such has proved to be the case. As can be seen from figure 2, many other

Japanese plum varieties will give good sets on Redheart.

Of particular interest to plum growers is the fact that Redheart will set fruit on the Elephant Heart variety (14.8 per cent on Elephant Heart in tests of 1950), as well as produce an excellent crop when pollinated by Elephant Heart.

It has also been determined that Redheart will give adequate sets on Sharkey and Santa Rosa when it is used as a pollen source—Sharkey pollinated by Redheart set 38.8 per cent in tests of 1950, and Santa Rosa set 3.8 per cent in 1949.

Redheart has shown no obvious weaknesses thus far, but it should be pointed out that all trees involved were young and such weaknesses as may develop with age have not had a chance to become apparent.

Characteristics of the fruit

As stated, Redheart is very similar to Duarte. This comparison of fruit characteristics is shown in table 1.

In one small experimental shipping test Redheart showed no tip-cracking after the transit period—a fault sometimes evident with the Duarte variety.

Redheart has sized satisfactorily. In a small commercial shipment made in 1950, the size distribution in 98 four-basket crates was as follows: 4×4 —19 crates; $3 \times 4 \times 5$ —24 crates; 4×5 —54 crates; and 5×5 —1 crate. In the 1950 season the sizes in the locality where these plums were grown were slightly smaller than usual, as shown by commercial packing house records for other varieties. Therefore, at the least, the $3 \times 4 \times 5$ sizes could be expected to be 4×4 size in most years.

In relation to shipping maturity, Redheart goes through the same developmental stages as Duarte, and apparently can be harvested for shipping on the same basis as that variety (see table 3). The appropriate time for harvest seems to be as the flesh changes color, becoming

red, and as the dullish blush color develops.

Redheart's place in the plum industry

Because of its season, Redheart appears to be more a plum for the foothill and Sacramento Valley fruit districts, where it will afford a good plum of the Duarte type—ripening a little later than Santa Rosa—and coming on the market with, or slightly before, the early shipment of Duarte from the San Joaquin Valley. In the latter area, the season between Santa Rosa and Duarte is shortened so that the harvest of Duarte usually overlaps that of Santa Rosa slightly, or at least follows immediately. Consequently there appears to be less demand for a variety maturing in the season of Redheart.

In a small commercial shipment made in 1950, with the fruit harvested about 5 days later than necessary, Redheart brought returns comparable to the best brought by the early Duarte shipments reaching the market at the same time.

The results of the pollination tests with Elephant Heart are again emphasized, as Elephant Heart has much to recommend it if it can be made to set commercial crops. The sets reported were obtained under experimental conditions.



The apparent superior characteristics and weaknesses of Burmosa and Redheart have been pointed out. It should be remembered, however, that the limited tests on which these observations are based do not assure commercial success of the varieties. Their introduction at this time is for test purposes.

Please note: Neither the University of California nor the Agricultural Experiment Station have trees of Burmosa and Redheart available. They can be obtained, however, from many tree fruit nurserymen.

HORTICULTURAL DESCRIPTION

BURMOSA

TREE: Upright-spreading to spreading; production fair to good, vigorous. **Old bark** color grayish-brown; scales tough, platelike, longitudinally oriented, with thin, dry, recurved edges; lenticels of medium size and number, transversely elongated, raised, rough, with lips grayish-brown or light brown, becoming grayish and relatively inconspicuous. **Current season's growth** green, becoming greenish-brown to reddish-brown with age and exposure; lenticels numerous on young growth, obscure, whitish, remaining numerous with age, but larger, of light brown color, not raised, or only slightly so, eventually becoming larger, grayish, and quite noticeable on older growth. On two-year wood lenticels are light brown, conspicuous, smallish, not raised or only slightly so; on the three-year wood conspicuous and grayish and then becoming as on old bark. **Vernation** conduplicate. **Foliage** abundant. **Shoot leaves** medium large size, approximately 9 cm long by 4.5 cm broad, thicker than spur leaves; shape oval to broad oval, occasionally slightly ovate, color yellowish-green to dark green, slightly lighter beneath. Blade slightly cupped, recurved, base rounded-acute, apex acuminate, acute, short, nearly flat or slightly wavy toward the apex; glabrous. Margin dull crenate, slightly irregular, each crenation tipped with a small, inconspicuous gland of grayish to reddish color, nearly straight, or slightly wavy toward the tip. Petiole short, stout, approximately 8 mm long; color greenish to red on the exposed surfaces, the upper side broadly and shallowly channeled. Glands 5 to 8 in number, or rarely 10, globose to oval, stalked, large and vigorous, borne on the apical portion of the petiole. Midrib lightly channeled on the upper surface, protruding below; color greenish to pink or reddish where exposed, especially on the upper surface on less vigorous trees. **Spur leaves** large, approximately 10 cm long by 4.5 cm broad, moderately thick, more or less obovate. Blade nearly flat, tip often twisted 90°, slightly recurved; yellowish-green to dark green; glabrous. Midrib and margin as for shoot leaves. Petioles medium thick, medium length, approximately 1.5 cm long; glabrous; color as for shoot leaf petiole. Glands same as on shoot leaves, except usually only 3 to 5 in number. **Leaf buds** medium to large for the species; shape obtuse-ovate, to ovate on spurs, plump, free or nearly so; color dark brown on the shoots to medium brown on the spurs, about the same as the bark color, glabrous. **Flower buds** small, plump-ovate, color medium to

light brown; glabrous. In general, the **branchlets**, **shoots**, and **young growth** are short, stout, vigorous; spurs short to medium length and stoutness, becoming branched.

FLOWERS: Usually 3 per bud, range 1-3, borne laterally on one-year wood, or on long-lived spurs. Pedicel length 1.2 to 2.0 cm, average 1.5 cm, color light yellowish green; glabrous. **Calyx** nearly funnel-form, often grossly irregular below the lobes, 4 to 5 mm high by approximately 7 mm across at the lobes; the surface slightly roughened or pebbled; glabrous. External color light yellowish-green, internal color dull yellowish-green, more yellow than outside color. **Sepals** 5 in number; medium size, approximately 4 mm long by 2.5 to 3 mm broad at the base, shape ovate, slightly cupped, apex obtuse, margin toothed. Color yellowish green on the dorsal surface, same as the calyx; sometimes rose-tinged, with a narrow margin and teeth rose colored. Ventral surface colored the same as the dorsal; dorsal and ventral surfaces glabrous; upright, not at all or only slightly reflexed at full bloom. **Petal** size medium, 9 to 11 mm long by 8 to 9 mm broad, shape usually slightly ovate to round, or rarely slightly obovate, usually somewhat cupped, with a short, inconspicuous basal claw; margin entire, sinuous; color white; the petals usually reflexed 45° or less at full bloom. **Stamen exertion** usually slightly less than the petals, maximum length about 9 mm, with a short and a long whorl, usually 30 or 31 in number; anther size medium, color yellow. **Pistil exertion** equal to or slightly longer than the stamens, 10 to 11 mm long; ovary and style glabrous. **Flowers** 21 to 25 mm across at full bloom. **Fruit:** Matures about June 10 at Winters, California; for shipping approximately 7 to 10 days earlier. **Size** medium-large to large, approximately 5.0 cm long by 5.1 cm cheek diameter by 5.1 cm suture diameter; average weight approximately 6.2 fruits per pound at maturity. **Shape** somewhat irregularly round-oval to oblatish-round; slightly asymmetrical, with the fruit apex slightly dorsal to the fruit axis; halves equal or very nearly so. **Apex** rounded to flat-rounded in general aspect; true apex (stylar scar) slightly depressed and somewhat dorsal to the fruit axis, with a definite bulge dorsally and a lesser bulge ventrally in some specimens. This gives a broad, nearly flat appearance to the apical portion of the fruit. Stylar scar a small brownish dot, usually obscure. **Base**, in cheek aspect, rather large, gently rounded to flat-rounded, at right angles to the fruit axis, or sloped slightly

dorsally. **Cavity** oval to round in outline, acuminate-conic, rather deep; shoulders wide, gently rounded, regular, or very broadly and obscurely ridged, somewhat depressed at the suture, and often slightly so opposite suture. **Suture** very shallow or an obscure line, occasionally marked by darker color; a rather broad groove at the shoulder, and sometimes lightly creased inside the cavity. Suture lips lacking, or very low, broad and evenly rounded, one lip occasionally slightly larger, especially at the apex. **Stem** short, rather stout; 8 to 12 mm long; color light green to yellowish-green, becoming more or less corked and brown; swollen basally, with or free from fruit; glabrous; pad small, of medium thickness, brown-margined. **Skin** ground color greenish yellow to light amber-yellow when full ripe, bright; over color or blush medium red, the color developing with maturity, and becoming full red when completely ripe. **Bloom** light grey, moderately heavy, making the colored portion of the fruit an attractive pink to light lavender color. **Dots** numerous, rather evenly distributed, except lacking at the base and in the cavity; obscure, brownish to reddish, aeolar to non-aeolar; a few to many becoming corky, light brown, small, roundish, the number varying with exposure, never prominent. **Flesh** color light or whitish to greenish-cream to light whitish-amber at full ripeness; stone cavity surface slightly darker. **Flavor** moderately sweet, mild; a distinctive but not strong aroma; good, only slightly acid at the skin. **Flesh texture** firm-melting, slightly dryish and soft granular just at maturity, becoming melting, juicy, and very fine-textured when full ripe. Flesh adheres to the stone only along the ventral suture—nearly completely freestone.

STONE: **Size** small, 2.0 cm long by 0.76 cm cheek diameter by 1.6 cm suture diameter. **Shape** oval to broad oval or ovate, very compressed; base broad, usually concave and usually at right angles to the stone axis, large; apex rounded, becoming acuminate, and ending in a sharp tip of medium length; stone more or less irregular and somewhat variable in outline. **Surface** lightly rugose or roughened, with a few rather shallow, longitudinal grooves toward the base, often roughly thickened just below the apical tip. **Dorsal suture** more or less raised or ridged, sometimes closed for its entire length except for a small hole at the base, or grooved basally and/or apically, often with one or two pits in the median portion, to narrowly grooved from the base to the apex; dorsal ridge more or less eroded. **Ventral suture** a sharp narrow flange, sometimes very narrowly grooved from the base to the apex, becoming lower toward the apex; more

or less eroded. **Lateral grooves** rather wide and deep, with the margins somewhat raised, often closed basally; the sides of the grooves more or less irregular, eroded. The space between the grooves and the ventral flange concave, narrow. **Color** light brown.

REDHEART

TREE: Upright to upright-spreading; production excellent, very vigorous. **Old bark** color grayish-brown to dark-gray, with striated bark showing light brown beneath; the striations irregular, longish, longitudinal; scales thin, tough, small platelike, with recurved edges; lenticels numerous, very elongated transversely, color light brown to tan, only slightly raised and corky, often being oriented in irregular rows along the axis of the branch. **Current season's growth** green, becoming olive green to brownish-green or light brown toward the base of vigorous shoots; lenticels numerous, many becoming raised, grayish to brownish colored; corky; erupting and splitting the surface layers in elongated, longitudinal, irregular cracks toward the base of vigorous shoots. One-year-old wood brown, becoming like the mature bark, the lenticels becoming elongated transversely. **Vernation** conduplicate. **Foliage** very abundant. **Shoot leaves** large, approximately 13.3 cm long by 5.8 cm broad; shape oval to slightly obovate; color dark green, with the lower surface slightly lighter. Blade nearly flat, with the tip straight to twisted, base rounded, apex acuminate, glabrous. Margin slightly wavy, singly to doubly crenate, with each crenation tipped with a small, brownish gland. Petioles stout, approximately 2 cm long; color light green to yellowish green; moderately grooved on upper side, glabrous. Glands globose to oval, more or less stalked; large, strong, 3 to 6 in number, borne on the apical portion of the petiole. **Spur leaves** medium size, approximately 10.8 cm long by 4.5 cm; broad, obovate. Blade slightly cupped, slightly recurved, the tip often slightly twisted, base acute to acuminate, apex acuminate, glabrous. Margin slightly wavy, otherwise like the shoot leaf margins. Petioles like the shoot leaf petioles, but slightly less stout, glabrous. Glands as on shoot leaves, except only medium size, and 2 to 3 in number. **Leaf buds** small, shape ovate to nearly round, plump, free; color brown to light brown, glabrous. **Flower buds** numerous on the spurs and usually 2 per node on current season's shoot growth; ovate, plump; brown to reddish brown, glabrous. **Shoots** stout and vigorous in aspect; spurs short, with many fruit buds.

FLOWERS: Usually 2 per bud, rarely solitary on one-year-old wood and on long-lived spurs;

inflorescence with 2 to several leafy ovate to elliptical bracts, with crenate, glanded margins; size variable, quite small to 1.2 cm. Pedicel medium long, stout, 9 to 11 mm long; green to slightly yellowish green, glabrous. **Calyx** cup-shaped to broad funnel-form, grossly irregular in cross-section to nearly round; the surface very slightly rugose or roughened, with veins slightly raised. Color green on outside, inner surface dull, yellowish; both glabrous. **Sepal** size medium, about 4 mm long by 2.5 to 3 mm broad at the base; shape ovate, slightly cupped, apex obtuse to nearly rounded; margin fleshy-toothed, with teeth gland tipped; glabrous on both surfaces. Dorsal color green to slightly yellowish, with a very narrow margin, which is somewhat broader at the base; the teeth white, pale. Ventral color the same as the outer, except base of the sepals white; sepals reflexed about 45° or more, but not reaching 90°. **Petal** size medium or slightly larger, 11 to 13 mm long by 7.5 to 8.5 mm broad, shape oval to slightly ovate, tapering to a claw at the base, slightly cupped or often flat; margin entire, slightly wavy; color white; reflexed to 90° at full bloom. **Stamen exertion** nearly equal to petals, length to 10 mm, number 31 to 35; anther size average or slightly larger; color deep yellow. **Pistil exertion** slightly shorter than the stamens, 7.5 to 9 mm long; green, glabrous. **Flowers** 26 to 28 mm across at full bloom.

FRUIT: Matures about July 19 at Winters, California, about 20 days before Duarte. **Size** medium or larger, about 5.4 cm long by 5.4 cm cheek diameter by 5.3 cm suture diameter. Pedicel medium in length, medium stout in diameter; color greenish or brownish, usually free from the fruit at maturity; glabrous. **Shape** round-ovate to nearly cordate, smooth, even, regular. **Base** flat-rounded to nearly flat, straight. Apex rounded or occasionally nearly blunt-pointed; smooth. Styler scar an obscure brownish dot, often with a very slight, hardly noticeable ventral and dorsal bulge. **Cavity** round-oval to nearly round, size medium, moderately deep, flaring-conic; shoulders very evenly and smoothly rounded to the cavity; smooth, slightly lower at the suture, quite regular. **Suture** a very shallow, broad groove, or sometimes only a line below the middle (toward the base), lightly creased deep in the cavity, or not at all, generally a broad, even

groove through the shoulder, becoming shallower to a line toward the apex. Suture lips very broad and low, rounded, not at all protruding, the suture side slightly flattened. **Skin** color dull amber green, completely covered by the overcolor which is a dull medium to darkish red, sometimes slightly purplish. Pubescence lacking. **Bloom** moderately heavy, grey. **Dots** rather small, but conspicuous, numerous, evenly distributed over the surface except at the base and along the suture; grayish, often with a narrow, dull greenish halo. Skin color is overlaid with a superficial dull silvery greenish mottling, closely resembling the typical Duarte plum appearance. **Flesh** color a bright, even red (over an amberish ground color), becoming somewhat darker at full maturity; typical blood plum; stone cavity surface color duller. **Flavor** sweet, mild, with a pronounced aroma similar to Duarte; skin only very slightly acid. **Flesh texture** firm-melting, nearly crisp, meaty, fine grained, excellent. Skin moderately tough, crisp.

STONE: **Size** medium, approximately 2.6 cm long by 0.78 cm cheek diameter by 1.6 cm suture diameter. **Shape** long oval, compressed; base medium to small, slightly necked; stem scar more or less concave, slightly oblique toward the dorsal suture, or occasionally straight; apex acuminate, ending in a short, sharp tip. **Surface** rather rugose or sharply roughened, with a few obscure longitudinal grooves or striations toward the base, often with a rather obscure thickened ridge from the median cheek portion of the base to the cheek of the stone (sometimes doubled). **Dorsal suture** is only slightly raised or ridged, recurved at the basal neck, and quite often rather sharply so just at the apex; grooved from base to apex, the groove rather narrow and of medium depth; the sides of the groove eroded. **Ventral suture** raised or ridged; broad, usually with a rather wide and deep groove from the median portion to the apex, the sides of which may be slightly eroded, roughened basally. **Lateral grooves** close, rather narrow, of medium depth basally, becoming shallower apically, rather uniform. No space between the lateral grooves and the ventral flange, but the sides of the latter roughened. Ventral flange often higher at the base. **Color** light brown.

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